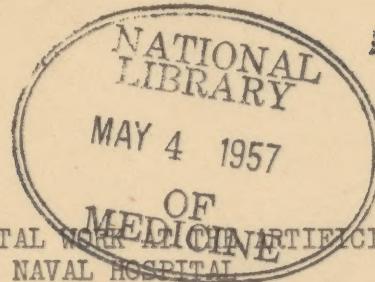


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Mare Island, California
1 January 1948

Committee on Artificial Limbs
National Research Council
2101 Constitution Avenue
Washington 25, D. C.

DOCUMENTS SECTION



MONTHLY REPORT OF THE EXPERIMENTAL ~~WORK~~ ARTIFICIAL
LIMB SHOP, MARE ISLAND NAVAL HOSPITAL

1947

During the month of December the job analysis for a draftsman and engineer have been submitted to the Civil Service Commission and at the present time we are endeavoring to hire personnel to fill these billets.

1. FUNCTIONAL ANKLE JOINT:

Ten additional ankle joints have been installed for field testing. Reports from amputees continue to be favorable. It appears that the greatest difficulty with this joint is the rubber bumpers which do not stand up as well as the same type of rubber in the conventional joint. This is due to the additional strain and torques on the rubber bumpers. The rubber laboratory at the Navy Yard has manufactured rubber with additional degrees of density and at the present we are installing this new type rubber. Two shins with ankles and the new type rubber have been submitted to Professor Eberhardt at the University of California for testing in the walking machine to determine wear and tear on the foot, ankle, and shin. The metal ankle block has been completed and we intend to set this into a shin and foot.

2. DIES FOR COSMETIC COVERING FOR LOWER LEGS:

The female patient using the shin with a cosmetic covering continues to be pleased and at present, no complaints have been recorded.

3. SUCTION SOCKET:

(a) Above Knee: Twenty additional suction sockets have been fitted for field testing including bilaterals. One case with Berger's disease is being fitted in a suction socket. The first course of the Suction Socket School was completed and both the surgeons and limb fitters were unanimous in their opinions of the value and success of the course. Preparations are being made to receive eighteen limb fitters and ten surgeons for the next course. The Veterans Administration would only allow eight patients for fitting which is an insufficient number to successfully carry on the next large class.

(b) Below Knee: A bilateral below knee amputee has been successfully fitted with suction sockets and a soft bucket and functional ankle. Additional cases are in the process of being fitted with suction sockets. We have not received the flexible plastics to be used as a substitute for the horsehide.

(c) Below Elbow: Two bilateral below elbow amputees are being fitted with suction sockets made with a soft bucket and a semi-rigid plastic. Suction is achieved with these sockets but it appears to be of too low degree of negative pressure for the bucket to hold on without biceps cuff and shoulder suspension. Additional work is required in the design of the bucket and fit before below elbow suction sockets can be successful.

(d) Above Elbow: The new above elbow suction socket is in the process of being fitted and we are re-designing the suction socket for McCully in order to secure a better fit. The above elbow suction socket appears to have a greater advantage than the below elbow and it is easier to fit. This socket will suspend 160 pounds lift.

4. CINEPLASTIC ARMS:

The cineplastic forearm prosthesis of Mr. Smith's has been changed. The motors are utilized to control the hand~~lock~~ instead of the flexor-extensor. This appears to work very well. The forearm cineplastic motor are ideal sources of energy for control in a prosthesis. The bicep cineplastic arms on Shuttoff are being re-fitted with new buckets. The pegs for the cineplastic motor on Shuttoff are being re-designed to reduce their bulkiness and complexity.

5. PRONATOR-SUPINATOR FOR ABOVE ELBOW:

The latest designs on the pronator-supinator are a decided improvement over the first models. The amputees utilizing them are well pleased with their action. A pronator-supinator has been designed and is being installed in a below elbow prosthesis. This occupies a space of two inches in length, has half-inch pull, giving 115 degrees of rotation.

6. ROBINSON HAND & COSMETIC GLOVE:

Additional cases are being fitted with the Robinson Hand and Cosmetic Glove. The results of field testing continue to be favorable. It appears that the degree of flexibility of the hand is too great and a model is being manufactured to reduce the amount of flexibility at the base of the hand.

7. SOFT BUCKETS AND IMPRESSION METHODS FOR BELOW KNEE STUMPS:

Additional cases are being fitted for field testing with the soft BK buckets and reports continue to be favorable.

8. SELECTRON WITH FORTISAN LAMINATE:

Two shins have been tested and withstood compression of $4\frac{1}{2}$ tons before breakage. A shin with six layers of fortisan fabric and phenolic resin plastic withstood compression tests of $3\frac{1}{2}$ tons before breakage. As mentioned in Item 1, the University of California are testing two shins on their walking machines.

9. PRODUCTION METHODS FOR LIMB MANUFACTURING: Production studies are continuing.

10. TLTING TABLE PROSTHESIS:

Work continues on the design and manufacture of two tilting table prostheses.

11. FUNCTIONAL JOINT FOR ELBOW, WRIST AND HIPS:

The functional elbow joints have been fitted on six cases and the amputees are unanimous in their opinion of its advantages over the rigid type joints. This joint allows greater freedom in flexion and extension plus allowing the amputee to utilize any remaining pronation-supination that is present in his stump.

12. FORGED ALUMINUM JOINTS:

75-ST forge aluminum joints are being installed for BK knee joints, AK knee joints and hip joints. No breaks have occurred in a year's field testing, except in one hip joint and in two BK knee joints fitted on a Gritti Stokes type of prosthesis. This break occurred at the stop section and it will be necessary to re-design the die in that area to allow for more metal in that part of the joint.

13. SUCTION SOCKET VALVES:

We are continuing to use the Sierra suction socket valves which prove to be satisfactory and are utilizing the suction socket valve that was designed at Mare Island for below knee and arms.

14. ABOVE KNEE BLOCKS:

The re-design of the above knee block is satisfactory and allows the breaking mechanism to be removed from behind.

15. MECHANICAL KNEE LOCK:

A model is being manufactured for a mechanical knee lock utilizing and incorporating the Mare Island knee break. A 64th of an inch thrust gives complete and solid locking of the break surface. This mechanism appears to have decided promise as it is a simple, self-contained unit and may prove to be practical and valuable for those amputees who require a locking mechanism in the knee.

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